MAIN CURRENTS

IN MODERN THOUGHT

Temple and Tank, Center of Village Life,
Bowana on the Muttra Road near Delhi, India.

VOL. 11 NO. 1

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MAIN CURRENTS IN MODERN THOUGHT

A co-operative journal to promote the free association of those working toward the integration of all knowledge through the study of the whole of things, Nature, Man, and Society, assuming the universe to be one, dependable, intelligible, harmonious.

VOL. 11 NO. 1 September, 1954 50 HILLANDALE ROAD, PORT CHESTER, N. Y.

PUBLISHED 5 TIMES A YEAR IN SEPT., NOV., JAN., MARCH, AND MAY.

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The Journal of the Foundation for Integrated Education, 246 East 46th St., New York 17, N. Y.

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For the photograph on the cover we are indebted to the Government of India Information Service.

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The corporate statement of Aims declares that the Foundation has been established:

1. To collect, create, and distribute authoritative materials which will encourage the development of unified overall concepts in education; to improve the balance of relationships between the physical sciences and the social sciences; to inquire into the phenomena of purposive activity in nature, man and the universe.

2. To assist teachers to understand and use such materials, and to develop an active, realistic, comprehensive philosophy which will communicate to their students the unity, coherence, and beauty of the world in which we live.

3. To remedy, solely by such educative measures, the conceptual and hence the ethical, social, economic, and political breakdown of our times, looking to a peaceful world order.

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The work of the Foundation is wholly educational, yet is referred constantly to the contemporary scene in all its aspects, no less than to the total available wealth of human experience and knowledge.

MAIN CURRENTS IN MODERN THOUGHT is published 5 times a year in Sept., Nov., Jan., March, and May, to call attention to significant contributions to learning currently being made by workers in the multiple fields into which knowledge has come to be classified. It relates these advances to each other and to the classical and contemporary views of Eastern, European and American thinkers. It is designed to save time for the reader by providing a vantage-ground from which the whole world of knowledge may be surveyed and kept in proportion as it moves toward integration. Its editors assume that the principles of art, the universals of philosophy, the laws of Nature and Man as formulated by science, and the truths of comparative religion, can be orchestrated into a harmonic, meaningful, ethical body of teachings which can and should be made the central core of curricular study in the educative process at all levels of development. In condensing text, square brackets [ ] indicate editorial interpolation. Three dots . . . in the text indicates a word, phrase or passage omitted in the interest of brevity or clarity. Other usages are standard. $3.00 a year. Foreign $3.50. Contributors to MAIN CURRENTS enjoy full liberty of opinion and expression in these pages. *Copyright 1954, by F. L. Kunz, Port Chester, New York, to whom all communications regarding MAIN CURRENTS IN MODERN THOUGHT should be addressed.* *Entered as second class matter April 13th, 1946, at the post office at Port Chester, New York, under the Act of March 3rd, 1879. (Re-entered as second class matter November 17th, 1953, at the post office at Port Chester, New York, under the Act of March 3rd, 1879.)*

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INDIA'S PHILOSOPHY AND WORLD RAPPROCHEMENT

F. L. Kunz

Foundation for Integrated Education

The Place of Science in Culture And in the Meeting of East and West

The final address at the eighth summer workshop of the Foundation for Integrated Education, at Wisconsin State College, Milwaukee, July 19-23, 1954, was directed to the following considerations:

Throughout human history all men have mobilized their concepts from every available source to arrive at their hypotheses as to the constitution of man, the nature of the universe, and the meaning of life. This process has been nurtured and evolved in the arts, sciences, sports, religions, philosophies, and in ethical, social, and political norms. Every culture has, by this means, arrived at conclusions and insights of life value. Thus every culture has a contribution to make to the whole.

All cultures except our own have integrated their science with the rest of their culture. Only in our own recent past have science and the rest of our culture been divorced. Gradual use of the means at hand for a restoration of balance and unity between the sciences and the humanities should assist our own culture to be so reintegrated as to afford a means of rapprochement between our and other cultures.

Broadly, two great groups of cultures have emerged—the East and the West. For the achievement of a settled world in the future, new attitudes must be developed and education must take account of these circumstances. Hence this query:

What is likely to be the result of an education which reincorporates science into the cultural experience, in bringing about world understanding, the meeting of the East and the West?

Taking India as instance and the new scientific outlook developing in the West during this century as an assumed starting point for a rapprochement, the speaker developed the accompanying argument.

The Foundation for Integrated Education is concerned with the development of a philosophy of the natural sciences through improving and teaching their deductive structuring, and with the creation of common understanding by study of methods which unite the sciences and the humanities. This might be called its immediate program. But the Foundation has also long-range interests with far wider objectives: to contribute to the growth of world understanding, based upon knowledge of and respect for the conceptual background of diverse cultures out of which men act. It is to this problem that I should like to address myself now.

Understanding another culture calls for something more than tolerance. It presupposes an effort toward elasticity of mind, and toward freedom from commitment to the superiority of our own culture. It is necessary that we try to understand what each society conceives to be reality, and therefore why that society acts as it does. In relation to what are called (perhaps condescendingly) primitive societies, anthropologists' achievements have been fruitful, and as a result our attitude toward the Navajo, Samoans and the Ona Indians of Patagonia and others has changed remarkably in recent years. We are beginning to see that each society has an internal integrity that is to be respected and from which a great deal can be learned, especially that ours is not the only way.

But in our attempts at rapport with more complex and highly developed societies we must admit our progress to be slow. Delay in good understanding of India and China, to speak of the major Oriental cultures, is dangerous. If the work of our Foundation could be pressed forward to assist in such understanding, world settlement could be accelerated.

Of all the ancient cultures, India is without doubt the most significant, primarily because it is the only Eastern society playing an important world role which has an Indo-European linguistic and mythological and folk background. Because this basic lingual kinship implies a common body of ideas, as Whorf and Kluckhohn and others have made clear, India, unlike China, could be understood quite readily, at the conceptual level, by us of the West. A rapport with India would also help us to re-evaluate our Hellenic-East Mediterranean heritage. For India is the only society left in the world with cultural patterns and conceptual wealth which in the superstructure are like our own heritage and which—unlike classical Greek or ancient Chaldean, Egyptian or Persian societies—have lived on into our day. In spite of invasions and the impairment of its social structure, India remains the heir to

a state of mind which I like to call pre-Aristotelian. Hence the Indian sub-continent offers the wealth of earlier ages, crowned by an Aryan philosophy that enables us to make living contact with ancient thought which elsewhere is dead.

Out of the immense complex we call India I shall try to select those few items about Indian philosophy and metaphysics which I think might be of major significance, first sketching in some geographical detail by way of background.

The immense rampart of the Himalayas curves from the north central Asian highlands, toward the sea at the Bay of Bengal, its internal watershed forming the Brahmaputra River, emerging between India and Burma. On the west is the titanic tumbled massif of the Hindukush Mountains to protect India on the northwest. Between is the Khyber Pass, as entry from the north. Between the Hindukush and the Himalayas emerges a series of rivers, particularly the Indus and the Ganges, the one sloping to the west, above the Vindya Hills, and the other to the east. The Vindyas thus mark off the southern land (the Deccan) from the northern. The whole of this Ganges and Indus Valley area is inhabited dominantly by Aryan types, people who speak languages that are cognate with European tongues, such as Hindi, Bengali and Gujerati.

Much of the country south of the Vindyas is mantled by a vast lava sheet. There is no evidence that this stratum has been under sea water since it was laid down. There is no question as to the antiquity of man in this area. There are in India lingual islands which have been shown to have affinities with tongues spoken now only in Australia, where they are found with stone-age life.

The basic cultural affinities in South India generally, as indicated by languages, are pre-Aryan but of uncertain age: Tamil, Telugu, Malayalam, Kannada. Not enough work has been done to show their major affinities outside India. To the southermost point, Cape Comorin, the super-imposition of the essential Aryan culture has long since progressed. It has crossed Palk Straits to Ceylon, occupied by Tamils and Singhalese, who have lingual and other affinities with our own background. The Brahmana class in South India employs Sanskrit as its sacerdotal and philosophical language, and so a type of unity has been laid over the whole country.

India has long had a positive science—but never any seriously entertained materialism—and a remarkable deductive-theoretical structure for that science. It has made original contributions, some of them quite unique, to the achievement of the Indo-European people, who have led in the development of the rational mind, and the ascendency of science. In particular the mathematical invention is notable. But as India's science led up to a species of transcendental realism, it follows that her philosophy, through which we can best approach the Indian people, is entirely alien to the science of the 19th century. Indeed throughout the time of the rising dominance of the British (beginning about 1600 A.D.), there has been a slow divorcement between the traditional thinking of India and the materialistic thinking of the West. The imposition of British thought on the universities of India, especially since 1857, has grievously impaired in the university educated classes loyalty to their inherited culture.

This philosophical divergence between Europe and India led to misapprehensions of Indian thought in Europe. What little metaphysics came to Europe from India in the 17th, 18th and 19th centuries was alien to the growing emphasis upon materialism, mechanism, and a lower kind of rationalism. For example, when the literature of Buddhism was brought to the West, the *Dhammapada* fell into the hands of Arthur Schopenhauer and he, being what he was, started Europe in on a misapprehension of Buddhism. Schopenhauer was a pessimist: for one thing, he despaired of one-half the human race, its women. His thinking generally was somewhat that of a neurotic genius, and he read nihilism into the *Dhammapada* and other notions quite contrary to the spirit of Buddhism. Again, when the *Upanishads* were first published in Europe, both the name and the philosophy were misconstrued. Hence the knowledge that Indian philosophy, though ideal, is also realistic, never took proper root in Europe. Until lately, a realistic idealism seemed unscientific to us.

Now we have had fifty to eighty years of a new science which emphasizes field theory as against mechanistic systems, deductively structured genetics, ecological biology, and contemporary (post-Freudian) gestalt and field psychology. All this gives hope of making rapport with India, but unfortunately the hope is impaired by the traditional European ignorance and misapprehension about India to which I have just referred. Let me say plainly, therefore, that 20th century science in the West is in remarkable accord with Indian philosophy, as I understand it. In view of my years of life and study in India, I may in fact say that the chief reason I feel at home in the Foundation for Integrated Education is that we are gathering this new science together so that 20th century science can deliver its true meaning. This deliverance must be autonomous. We cannot countenance any attempt to impose Indian or any other philosophical concepts upon Western thought. It is just because the integration of our contemporary science, thus self-engendered, shows that the last eighty years of Western achievement validate essential Indian thought, that one is encouraged to believe that, as of today, good science and the cultural heritage can be taught as one whole.

I might say, in conclusion to this part of my remarks, that Buddhism is at root identical with Hinduism. Buddha was born of a Kshattriya ruling class family in India. He was a Hindu throughout his life, but he was a reformer. He challenged the Brahmins of the time with respect to their over-formalism, and their failure to live out what they said they believed. He instituted moral and social reform; and he taught

further only those who were willing to experiment with their own lives. It is merely because he was a reformer that he seems to have separated himself from Hinduism. He was, in truth, the thorough embodiment of Indian philosophy and metaphysics. It may be that the higher levels of his psychology (we might call him the greatest Indian psychologist) have been lost to view. When they have been brought back to notice, their complete rapport with Vedic thought can be readily demonstrated.

What, then, is required if this thought is to be correctly apprehended?

Indian philosophy was a natural growth, resulting from those intellectual skills which we consider one of man's crowning achievements, and which made both that philosophy and our science possible. Those skills were quite highly developed in the early Hindus. Perhaps as early as 500 B.C. and certainly no later than 50 B.C. the Hindus invented zero (Sanskrit: *sunya*), place numeration, equations, some algebra, etc. (The concepts were theirs, not the Arabs', who later used zero calling *sunya* çifr, hence our word cipher.) In the Indian system, zero was originally represented by a point. It was still being used in that form when the Arabs became acquainted with it, and zero in Arabic is still a point, although later, when the decimal system was invented and the point became useful for other purposes, the Hindus themselves drew a small circle for zero. Metaphysically, however, this is misleading, and the original form, the point, is correct to express zero as regards India's metaphysical use of mathematics.

The interest of the Indians in metaphysics was as keen as their interest in science, even while they were developing their skills in physical astronomy and practical medicine. They perceived that if the scope of science be enlarged, then and then only a good metaphysics would emerge. Hence the great aim of Indian thought was to make what we call subjective experience objective to consciousness. That is to say, they greatly increased the content of positive science. This led them to find reality under its material vesture, but they also declare that there is a direct cognitive approach to reality. Their view is that human consciousness is not an epiphenomenon, an intermittent by-product of biological processes, but a unique entity. I should like to try to explain this concept a little more fully.

If we hold that the persistence of the sense of personalized entity is a fundamental fact—that although consciousness may be obscured by sleep and by biological processes, it is nevertheless something distinct and unique—then we are siding with the Hindus. If, on the other hand, we believe that the phenomenon of consciousness is merely a by-product of biological processes and that behaviorism is the sole correct view of man's psychology, then we side with the aspect of learning which sees in physical existence the only reality. The Hindus agree, as I have said, that physical events do in themselves mask and also reveal reality, but they emphasize that all man can derive from this reality, in the form of immediacy, are the discontinuous fragments of sensate experience: sights, sounds, a bit of color, a bit of taste, a bit of tactile experience. Consciousness, on the other hand, is itself immediate experience and has a meaningful self-evident continuity. It is continuous in the sense that we never deny from day to day that we are ourselves. A rational person starts with his continuity, his seeming self-responsibility, his self-identity.

This little sense of self which we have is no more the whole spiritual reality, of which individual consciousness is a part, than the sensate fragments we experience are the true physical reality. But the Hindus hold that in the operations of consciousness as such, in its own field, lie means of contact with spiritual reality, just as our sense experiences are avenues to physical reality. From their point of view, when a man makes constructs in his mind, and evaluates them, he is actually observing his deep operations, from the still deeper level of reality. Gestalt experiments confirm this view. (Incidentally, the Sanskrit word for mind is *manas,* or the thinker, and from it comes the English word *man.*) Moreover, there is no possibility of supposing that the operations of mind are unnatural or artificial; they are all part of nature, which is one face of reality. There are, as it were, the two poles of material and spiritual reality, and in between lie all the things that are familiar experience to us.

The goal of Indian science is to retreat progressively from this familiar plane of material existence toward the pole of spirituality, making the things of inner experience more and more objective, so that concepts and emotions may be examined, and the machinery discovered which permits mastery of the personal situation. It is this Indian concept of the world as will and idea that interested Schopenhauer so profoundly.

To put the view in another way, reality for the individual, that is, immediate, true experience, does not exist only on the plane of perception, the P-plane (to use Margenau's term) nor is it buried just beneath it. In Indian thought reality is no less connected with the subtle nature of man that gradually deepens until at last it merges into a cognitive reality common to man and to nature. Reality resides in all expressions of consciousness if they are examined rightly, because the spiritual and the material poles are connected by a field (*kshetra*) which interpenetrates this whole area of mind, psyche, soul or whatever we want to call the regions in which man inwardly lives. The triumph of Indian philosophy is that it perceives the subjective and the objective reality as one and the same, achieving by specific means an uncompromising monism.

This doctrine involves a peculiar and important thought which it is essential to grasp if we hope to understand and cooperate with Indian society. The Hindu view is that since the cognitive process and the material process are the polar ends of a continuum, it follows that psycho-biology is the central subject of study. This view is in complete agreement with Descartes' famous dictum, "Cogito, ergo sum," which, of course, means "I cognize, therefore I am."

This expresses our basic knowledge that we are self. But the next thing we know most immediately is the psychosoma, the thoughts and sensations which surround self. We are all prisoners, our cognitive process caught within our bio-psychological process. All the material reality implied by the P-plane is thus two removes from our native state of simple cognition. Thus, to the Hindu, biology is the central subject, that is, bio-psychology, something like our psychosomatic medicine, in which the psychological processes are included.

A consequence of this central importance of biology is that in order to be a good scientist, from the Indian point of view, if certain conclusions are reached, they must be lived out. The type of Western speculative philosopher who is not particularly interested in relating his views to his own conduct would be regarded in India as a very idle fellow. There it is felt that if one has arrived at certain philosophical conclusions and lives them through, one can empirically determine the value of those assumptions. It is this that makes Indian philosophy so realistic, and gives it an immediate moral and social meaning.

When I said before that Indian science is like our own, you will understand that I did not mean to imply that the physical techniques are similar. I mean rather that the basic intellectual skills and some of the general conclusions of Indian science are very like our own today. For example, a fundamental of Indian thought is the concept that the universe is insubstantial, that matter does not exist, being an illusion. This is called the *maya* doctrine. To the extent that our theories of the electrical composition of matter lead us to believe that matter, in the earlier, substantial sense, does not exist, we are in agreement with India, though they go further. Again, without the methods of observation which we have, a superior astronomical chronology was developed. They devised the notion of *yugas* which are eras or major cycles, and I might say in passing that the figures given in ancient Indian philosophy for the age of the present universe, which is the total series of cycles that constitute its entire span of life, are almost identical with those which contemporary physics arrived at a few decades ago.

But even more remarkable is an Indian conclusion with regard to the origin of the universe: that it originated from a vast sphere in space, called the *Brahmanda. Anda* means egg, and *Brahma* is the term for active deity. So, according to this concept, the universe arose from a spherical structure which was not only physically real but also charged with principles ideal in character. One is reminded of Lemaitre's doctrine of the origination of the universe as a compact mass which now is apparently rushing away from its center in all directions.

And finally, the Indians had a doctrine of evolution, rough, but in a sequence similar to our own. They came to the interesting conclusion that present man was preceded by primitive men, and that primitive man was preceded by a primitive mammal, called a *varaha*. That was in turn preceded by an amphibian creature symbolized by a tortoise, and before that they supposed a fish era to have existed. No one is quite sure how the Indians arrived at this concept of evolution, but it is certain they believed that physical man is the result of evolutionary processes. However, in one respect their view of evolution is strikingly different from our own. The *Vedas* and *Upanishads* indicate that the non-material field evoked the evolutionary sequence. The conclusion they draw from their philosophy is, further, that man can take his own evolution in hand, individually, that he can accelerate his own development by exercising his will on himself.

I should now like to explain briefly how one can explore Indian philosophy for himself. Generally, there are two sources. The first is what may be broadly called the religious cultural groups, that is, the art of the religion, the festivals, all the folk experience, and the theory which lies behind all of this, summarized by the term *agamas*. There you will find familiar words like *Shiva, Vishnu,* and *Brahma,* the Indian trinity. This immense body of material is akin to our own folklore. But unlike us, the cultivated Hindu believed that folklore contains a great deal of valuable information about the universe, put into somewhat popular form. However, he primarily draws his philosophy not from this but from systematized and diversified attacks on reality. They are called the *darsanas.*

There is only one philosophy in India. There has never been any materialism there that amounts to anything. All true Indians were (and some still are) brought up through the system of *darsanas,* a word which may be translated as insights or standards or methodologies which arise from basic assumptions. There are six of these *darsanas,* and they come in couples. I shall start describing them from the rational base because the subsequent *darsanas* take the conclusions of the earlier ones as established.

The first couple consists of logic, *Nyaya,* coupled with what is discovered as the result of logic, *Vaisheshika.* This latter word means particularity and signifies that the world is made out of particles. It corresponds roughly to western science. This logical atomism is the mental and material standard. It was India's own achievement. Just when it was formulated is not certain.

One of the problems in studying the history of Indian philosophy is its dating. However, the antiquity of the *darsanas* is well known, for the reason that the Buddha, who lived about 500 or 600 B.C. fortunately reviewed all the systems that existed during his lifetime. Therefore it has been established that the *Nyaya-Vaishesheka* system was available not later than the time of Democritus, and well before Euclid and Appollonius of Perga. The great triumph of Democritus was his concept of the point-atom, which was mathematical and propertyless, unlike the later atom of Lucretius which was endowed with some properties. Now the fact is that the *Nyaya-Vaishesheka* thinkers concluded, separately and independently, that the world is made out of mathematical points in a field.

Without our kinds of empirical evidence, they reasoned how many atoms there must be in a mote. They held that though the mote is extremely small it must have a structure, a structure defined by dimensionless points. This resembles our notion of a quantized region.

For those who would like to go somewhat more deeply into this subject of the *Nyaya-Vaishesheka,* I should like to recommend a book, the only one of its kind in English, called *Hindu Realism,* by J. C. Chatterji. This volume affords real Indian thinking on the subject of physical (in contrast with spiritual) realism.

The second couple of the *darsanas* is at a different level. As previously explained, the first standard is mental and material or scientific. The next development is an affective and biological standard. This also comes in two parts: a method and a consequence. The method is called *yoga,* a term which is cognate with our English word *yoke.* It means the yoking of the emotions and the mind. The mind is to be clear in its logical processes, but the emotions are to be brought into play so that the mind is not cold or sterile, and inert to such important matters as aesthetics and religion. It is perfectly proper to call yoga psychology, but it is a profound and challenging psychology.

Now the consequence of exercising yoga disciplines is a new outlook upon the same universe, and that it carries further than the *Nyaya-Vaishesheka.* The latter, as I have indicated, includes atomism and all the concerns of physical sciences with the insentient world. However, the Hindus would say that if the rest of nature is to be included, the problem of life must be attacked by a method that incorporates the findings available through one of life's unique features, namely, feeling. The result of such attack is called *Sankhya,* meaning enumeration—that is to say, the categories of reality which may be found in our own immediate psycho-biological experience. Originally, in the Hindu atomic realism, there were nine of these, called the *dravyas,* but they are now in the *Yoga-Sankhya* reduced to two: cognitive process and material process, *purusha* and *prakriti.* The conclusion is that man is, in his consciousness, the pole opposite to materiality. By taking his stand in his consciousness, as a *purusha,* he is capable of examing all the processes in which he is involved: his mind, his emotions, and all the rest of it. He can objectify what we in the West think of often as purely subjective. This standard, the *Yoga-Sankhya,* is the turning point of Indian philosophy.

Finally, there are two more standards, also coupled, which have been made popular in the West. They are properly called the *Purva* and *Uttara Mimansas. Purva* is probably cognate with our word *previous; Uttara* with *utter,* or *later.* In other words, they are the earlier and the later exegeses. When they are attacked by means of the two standards I have previously described, the whole mass of the scriptures and the Agamas can be re-interpreted. The name under which these two final standards, the *Purva* and *Uttara Mimansas,* were united and made known in one system is the *Vedanta.* The founder of the system, Shankara or Sri Shankaracharya, was probably the greatest dialectical genius the world has ever seen, presenting a world view based upon an exquisite balance of the affective and the logical processes, lived out, not merely speculated. The *Mimansas* were collected through the ages from many sources, but because of the over-riding power of Shankara in making the inherited material rational, his name is the one principally connected with the *Vedanta.*

I should now like to try to review, very briefly indeed, some of the major concepts of Indian philosophy.

From the over-all point of view, man is entirely a natural phenomenon. He is in the hands of nature. Yet he has his root in the noumenal reality. Therefore he can accelerate his growth, and by so doing, he will in the end escape from nature. This shift is from immanent to transcendent Reality. The goal of Indian experience is thus to conquer and develop oneself, so that one no longer has to be immersed in passing processes. Such was reputedly the achievement of Buddha. That goal, freedom, is given in Sanskrit the name *moksha,* and is identical with the experience called *Nirvana* in Buddhism. The aim of Indian life is therefore interior quietude and self-conquest, and finally, mastery of nature. Self-mastery comes first, mastery of the environment second, and that is regarded as the safe sequence for society, also.

We in the West have reversed this order to a considerable extent, and we are now beginning to see the perils of such a course. We have done so much with sciences of the insentient that they practically engulf us, at least, their products do. The original view of the Indian is that if the task is begun more centrally, and the individual achieves skills for self-discipline of the right kind, he will be a better person for it, and better able to cope properly with his environment. The Buddha never expected that everyone would achieve *Nirvana,* in a single existence at least, but he felt that it was good for people to know about it and the possibility of its achievement.

Nirvana, I should repeat, is certainly not obliteration. The word literally means "blown out." The passions are blown out; so are the desires for sensate experience, and the feeling of individual isolation, the mistaken notion that each has of himself as an isolated consciousness, is dissipated. This is an illusion, the great illusion, *avidya,* unwisdom. One is a consciousness in God, as Spinoza saw so well. Whatever there is, phenomenal and noumenal, is divine, and we are reductions of that noumenal divinity to pinpoint consciousness.

Indian philosophy is intended to permit man to understand, and so master, the psycho-biological machinery which at first engulfs him and carries him helpless from experience to experience. The philosophy indicates how he is to discipline this organism and make use of it, and thus gradually to attain insight and perspective and serenity.

In sum, Hinduism states that the universe, which

was put forth from a continuum called *Parabrahm,* is made out of atoms that have no substance. The behavior of these atoms is governed by Reality, *Parabrahm,* which is always in the background, pervading the whole. Out of That, the universe is engendered, unfolding naturally. Now it is also said that phenomenally man is involved in this evolving process. As a consciousness he is rooted in this super-phenomenal background, transcendent Deity, and his fully-conscious union with Deity, through attainment of *Nirvana,* is only possible if he satisfies the natural requirements. In other words, one cannot turn one's back on nature and simply deny it. Fulfillment is the necessity, not denial. One may feel that this description implies separation, or dualism. From one point of view, the process seems to be dual, but this is incorrect. Nondualism is achieved in Shankara's *Vedanta* philosophy, which is called *Advaita,* meaning not dual. This view postulates a monistic universe in which naturalism is a component; it is founded on Something that is beyond nature as we know it, but is not irrational.

Let us suppose that there is no universe, but only a state of maximum entropy, which we call complete domness. There are no island universes, no solar systems, nothing. Such a condition is called in Sanskrit *Pralaya,* meaning "Before there are places." The Deity is in sole possession of what will be a universe. Reality alone is. Now the problem arises, how does That emerge without breaking into fragments? The *Vedanta* states that there is latent in Deity an infinite number of mathematical points (the *paramanus* of the *Nyaya-Vaishesheka*), and these do not create division because they *are* only points, nothing. These points are called (in the *Vedanta*) *Mulaprakriti,* the "root of matter," and out of them both matter and egotistical consciousness emerge at given stages.

The emergence is difficult to describe without using inadequate symbols. It is said, in the celebrated tenth chapter of the *Rig Veda,* that God breathed within Himself. (The word *Brahman* is the same as our word *breath,* compare the Latin *spiritus.*) Deity breathed within Himself, and that breath was a self-denial. This is the old doctrine of privation of God, or the Void. Wherever there had been a mathematical point, there was now, as the Latins used to put it, Deity *in absentia.* Every point has now become a source of energy pouring out in every direction. As these points, called *Paramanu,* are absolutely nothing, God is still undivided. Actually, nothing has happened. The points, which are only ideal, or fictions of the imagination, become bodiless particles by a privation, a denial by Deity, his inbreathing, and that releases free energy into the field. The change constitutes or produces active Deity in uncaused Deity.

From this moment on, the behavior of these empty particles is in accordance with the character of the surrounding field, or Reality, but as they are in themselves nothing, the material universe is made of nothing, and it is only its behavior and processes that reveal some of the Reality. Therefore, there is no duality of spirit and matter, for the universe is always and entirely Deity, and nothing else. It appears that there is no great religion that does not have this uncompromising monism buried somewhere in it. In Indian thought it is explicit.

As for man, according to the *Vedanta* he is one of those particles, now called *Atman.* His consciousness is an egotism of isolation, which separates him from the pervading Deity of which he is a part. Man's only real experience is divine; all the rest is limited, partial, illusory. Hinduism holds that the *external* universe is deterministic, but in such a subtle way that we have the illusion of freedom, and we are encouraged to use that freedom. It is in this way that we grow. And ultimately we are able to break through the illusion of our isolation to the divine Background. This sense of isolation, of egotism, which is the ordinary naive consciousness of man, is the great illusion, *avidya* or ignorance, which means lack of knowledge that we are divine. Destruction of this ignorance, the attainment of enlightenment, means realization of the true nature of man. Such insight is the object of Indian science, philosophy and metaphysics.

"April 7 (1869). They were saying that Berthelot had predicted that a hundred years from now, thanks to physical and chemical science, man would know of what the atom is constituted and would be able, at will, to moderate, extinguish and light up the sun as if it were a gas lamp. Claude Bernard, for his part, had apparently declared that in a hundred years of physiological science man would be so completely the master of organic law that he would create life in competition with God. To all this we raised no objection, but we have the feeling that when this time comes in science, God with his white beard will come down to earth, swinging a bunch of keys, and will say to humanity, the way they say at five o'clock at the Salon, 'Closing time, gentlemen!'" Translated from the *Journal* of Edmond and Jules de Goncourt, Ed. Flammarion, Paris, Vol. III, P. 217.

A COURSE IN COSMOGRAPHY FOR NON-SCIENCE MAJORS

Harlow Shapley,
Harvard University

. . . My current assignment is to describe in some detail a practical course of study in Cosmography. Such a course has been designed in Harvard University for the non-scientific student, primarily for juniors and seniors concentrating in the humanities and social studies. Quite properly others have been admitted to the course, among them undergraduate students concentrating in science, graduate students, and visiting instructors. Persistent curiosity and a bit of spiritual courage are the only prerequisites. The course is listed as one of the two or three higher level offerings in science for the program of General Education in the University.

[I have had] . . . a growing awareness of the similarity of concepts throughout the various sciences and . . . interest in the location of man as thinker and dreamer in the spaces of the stars, in the times of the geological strata, and in the complex of materials of the animate and inanimate world. At first glance the endeavor appears much too ambitious; in practice it has worked out very well.

. . . On all sides appears a unity in diversity. And . . . when we see that many rules are the same for cells and atoms, and when we concede the very impressive probability of millions of planets with highly developed organisms, we conclude that the world of life should be admitted as a part of the cosmic program.

Cosmography, therefore, must have extensive and complicated content. It appears to be manageable, however, if used chiefly as an instrument of human orientation. In what follows I report on an attempt to take a completely objective view of the material universe, with principal emphasis on the basic entities and on the extent to which the exploration of them appears to pinpoint terrestrial man in the over-all scheme.

Our sense organs are definitely limited in number and power, and our experience in thinking about the cosmos has extended throughout only a few revolutions of the planet Pluto. Too much should not be expected of us. But from where we now stand in knowledge of the world it appears that the basic entities of the universe are *Space, Time, Matter,* and *Energy*. There are numerous subentities, chiefly derivatives or combinations of one or more of these four, and we are tantalized by the possibility that additional hidden entities exist for which we can present no blueprint and can write no easy equations. Most clearly there may be an independent world-dynamic that we could call Direction, Drive, the Will of God, or "Consciousness." But if it be Consciousness, the concept must be of cosmic extent; nothing merely human, nothing that is only terrestrial has a rightful place in cosmography.

Of the four entities listed above we note that matter and energy are two forms of the same thing, tied together with the most popular equation of our times, after $2 + 2 = 4$, namely $E = Mc^2$. And further, by relativity theory, space and time are now commonly united as space-time. For our present practical approach, however, we shall ignore these postulates that arrange our entities in two pairs, and consider each entity separately. But first a few remarks on the techniques of human understanding.

Four Primary Alphabets

History records that the human cultures of the past few millennia have been based to a large extent on a few simple aids to learning and communication which we shall, widening the definition, call *alphabets*. They have enabled men partially to coordinate and to comprehend the complex world in which they find themselves. The alphabets have also enabled men to advance those cultures and build societies. The primitive grunts, squeaks, and gestures did not suffice. Evolving man had to write and count, and do so more effectively than did the animals and his own jungle ancestors. For effective communication he had to associate sounds and ideas with symbols. He needed, and many times devised, tables of symbols. Reading, writing, and arithmetic became essential, and two elementary alphabets appeared early in the form of the A, B, C's and the 1, 2, 3's . . .

Two other elementary alphabets have long existed —one connected with the entity *Time* and the other with the entity *Space*. I refer to the calendars of days, weeks, months, and years, and to the terrestrial latitudes and longitudes that permit the determination of the boundaries of fields, cities, and states.

So far as the principal elementary alphabets are concerned, only these four are commonly recognized. For the study of cosmography, however, and the general problem of understanding a world that has become enormously rich in information content, the elementary alphabets do not suffice. It is proposed to recognize here a comprehensive "alphabet" for each one of the four entities: space, time, matter, and energy. In other words, we shall reduce somewhat the natural complexities through the use of tabulations that should aid in our orientation. Fortunately, two of these tabulations, which we shall also call alphabets, are already at hand, perfected, and in professional use.

Space

Many years ago I was impressed with the obvious fact that double stars are found in star clusters, which

in turn are sometimes in pairs and groups, simulating clusters of native villages assembled in ethnic regions; also that galaxies are sometimes in pairs, groups, and even extensive clouds, much as the mounds of ant colonies of a particular species are frequently paired and grouped in a propitious field. Further, an assembly of meteors makes a comet; an assembly of molecules makes a wasp or a man, and a group of men or wasps makes a colony. Organizations of organizations are clearly a tendency of nature.

These simple observations led me to write out in detail a system of material organizations—a series extending from the hypothetical sub-electrons through atoms and colloids on to stars, galaxies, and the space-time complex. Everything material is included, even the undiscovered. Such a system of organizations, arranged in order of increasing average dimensions, provides a sort of alphabet or table of orientation for that fundamental entity *Space*. It provides a framework upon which to spread ideas concerning the compulsions and attractions involved when individuals, physical or biological, form groups . . .

The negatively numbered classes in Table I are in the Microcosmos; the positively numbered classes are macrocosmic, with gravitation the dominant compulsion. In the synoptic listing of organizations presented herewith, only Classes —4, 0, and + 7β are subdivided to illustrate the general plan. The unfilled lines for both classes and subclasses are a gesture looking toward the ingenuity of the future.

TABLE I

A CLASSIFICATION OF MATERIAL SYSTEMS

—5 . . . . . .
—4 Corpuscles (Fundamental Particles)
(α) . . . . . (ζ) Positrons
(β) Radiation quanta (η) Mesons, 1 to *x*
(γ) Electrons (θ) Neutrinos
(δ) Protons (ι) Antineutrinos (?)
(ε) Neutrons (χ) . . . . . .
—3 Atoms, 0 to 100+
—2 Molecules, 1 to *n*
—1 Molecular Systems, Crystals and Colloids
0 Colloidal and Crystallic Aggregates
(α) Inorganic (minerals, meteorites, etc.)
(β) Organic (organisms, colonies, etc.)
+1 Meteoritic Associations
+2 Satellitic Systems
+3 Stars and Star Families
+4 Stellar Clusters, Open and Globular
+5 Galaxies
+6 Galaxy Clusterings
+7 The Metagalaxy
(α) Organized Sidereal Bodies and Systems
(β) The Cosmoplasma or Matrix
(α) *Interstellar Particles*
(β) *Interstellar Gas*
(γ) *Radiation*
(δ) . . . . . .
+8 The Universe: Space-Time Complex
+9 . . . . . .

Time

. . . For the better timing of operations in the material universe we need a powerful calendar. Those that now conveniently hang in office and home are of no use in measuring the transmutation of hydrogen into helium and the release of the energy that runs the stars. Nor are such calendars useful in considering the evolution of beetles or the rotation of a galaxy. But for the latter a most impressive calendar is already at hand — the geological timetable . . .[1]

Matter

The third table for aid in cosmographical orientation is probably the most compact and meaningful compilation of knowledge that man has yet created. The periodic table does for matter what the geological table does for time . . .

Energy

Only the table that simplifies the consideration of energy remains to be presented. Such a tabulation lies in the so-called ether spectrum, or electro-magnetic spectrum of radiation. It is not so satisfactory as those available for matter, time, and space, and it is not all-embracing. There are energies, gravitational and electrostatic, that are not directly included in the radiation sequence. But for cosmography the most important energies are those of the electromagnetic spectrum . . .

Leaving out the subdivisions, we can exhibit this tabulation in brief and simple form

TABLE III

RADIATION SEQUENCE*

(—20 to —12	Cosmic rays)	—6	Infrared
—11	Gamma rays	—4	Heat rays
— 9	X-rays	—1	Microwaves
— 6.7	Ultraviolet	+ 1	High-frequency radio
— 6.4	Violet }	+ 3	Radio
— 6.3	Green } Light	+ 7	Power, light
— 6.2	Red }	+ 8	Macrowaves

* The numbers are wave lengths in meters, expressed in powers of ten. The spectrum intervals vary in width and there is some overlapping.

An Outline for a Study of Cosmography

Cosmography has no satisfactory text as yet. The handbooks that describe one science after the other and are sometimes used for "orientation" courses, do not suffice for various reasons. Such texts do not integrate the selected items from the numerous fields of knowledge into a single theme; and they rarely report on contributions from the fields of philosophy, literature, and social studies. A balanced textbook will be difficult to produce. There is, however, much published material now available in the various special fields from which instructor and student can each produce his own unwritten text. And these special treatises have been written so skillfully that even a non-scientist can derive a sufficiently clear picture for his cosmographic guidance . . .

I have found that the goals of the course can be attained through the presentation of the subject matter under the following general heads:

A. Introduction: scope, method, and contents
B. Matter as a fundamental entity
C. Energy as a fundamental entity
D. Time as a fundamental entity
E. Space as a fundamental entity
F. The minor alphabets of cosmography
G. Evolutionary problems
H. Retrospect and prospect.

[1] Table II, "Geological Time Table", giving the ages in which the various animals and plants were dominant, is omitted.

. . . For students well trained in the sciences, preferably at the graduate level, an advanced course in cosmography can be simply outlined, but not so simply administered. The essence of such an advanced course, and of the elementary approach as well, is inherent in the plan that the physics and chemistry of the universe, as well as the biology and our psychological responses to cosmic concepts, are not at any time separated from the other fields . . .

The following outlines, with brief comments on a few selected subjects in each of the sections, *A* to *H* listed above, show in some detail the proposed (and practiced) content of the course.

A. Introduction

1. Definition and scope of course
2. Power arithmetic
3. The basic entities
4. Life throughout the universe
5. The elementary alphabets
6. Higher alphabets as guides to orientation

. . . Early in the series of lectures the distribution of protoplasmic life throughout the universe is introduced, not because of its basic importance, but to discover whether we are justified in treating as a significant feature of the cosmos a phenomenon of which we actually have knowledge only locally. A consideration of primitive organic compounds and organisms, and of the abundance of stars, easily convinces us of the wide distribution of this phase of chemical evolution. The phenomenon of "livingness" is accepted therefore as a significant part of the cosmos—extraordinarily interesting though very small.

Various approaches to the subject matter of Cosmography can be devised, but we follow, as indicated above, the one that associates its concepts, content, and plan with the summaries provided in the four important tabulations which, along with the more elementary alphabets, may be presented as follows:

I. Primary Alphabets
1. The alphabet of letters
2. The number system
3. Calendars
4. Maps

II. Higher Alphabets
1. For matter—the periodic table
2. For energy—the ether spectrum sequence
3. For time—the geological age table
4. For space—a series of material organizations

In addition some minor tables, narrowly specialized but of high value as aids, will be considered in a later section.

Our presentation of the four basic entities, with some preliminary searching for other fundamental features of the cosmos, and a consideration of the interrelationships of these four, conclude the introductory part of the course. But in these early lectures we are already concerned about the fewness of the sense organs with which man is equipped and which he must use if he is to essay the difficult exploration of a multi-phase universe. Sight, hearing, taste-smell, the senses of heat and cold, and a variety of mechanoreceptors comprise his natural equipment, and in none of these does he excel all other animals. He has no natural sense organ for the detection of short waves of radiant energy. He has no natural recorder of radio waves, nor a register of the phenomena of magnetism. To know much about these common manifestations of nature he must resort to complicated gadgetry. Ingenious artifacts have now helped to reveal several important facets of the cosmos unknown to man's primate ancestors, but how many equally important aspects remain totally concealed . . .

B. *Matter* as a fundamental feature of the cosmos can be presented under the subheadings:

1. Periodic table—an alphabet for matter
2. Introduction to the brighter stars
3. Cosmic chemistry
4. The chemistry of earth, air and animals
5. Argon and immortality
6. Tennyson and the scientific philosophers
7. The collapse of Sirius *B*

. . . C. *Energy* as a fundamental entity can be appropriately presented under the following headings:
1. The ether spectrum—an alphabet for radiation
2. From cosmic rays to light to radio to macrowaves
3. The speed of light—a touch of relativity
4. Explosions on the Sun (motion pictures in hydrogen light)
5. Radio astronomy through an atmospheric window
6. Rocketry to the upper atmosphere—penetration of the ozone
7. Modern alchemy and the smashing of atoms
8. Fission and fusion, on the earth and in the stars

. . . The fusion of hydrogen atoms to form helium, with the release of tremendous energy, had been a part of the accepted creed of astrophysics for a generation before the possibilities of hydrogen bombs became a matter of widespread public concern. It is now known that the majority of the stars live by these alchemical transformations. Without such sources of energy our Sun would long ago have run down and presumably we and our problems would never have existed. No doubt the fission process of releasing energy also operates naturally in the stars, possibly in partial equilibrium with a formative process that builds against the natural decay of large unstable atoms. We surmise that most of the common elements have been built up, in ages long past, from simple and primeval hydrogen into carbon, oxygen, magnesium, and other elements. But we are not sure as yet about the origin of stable heavy atoms, like platinum, gold, and lead, which require extreme conditions for their formation out of photons, protons, neutrons, and electrons. Did these stable elements come into existence during the few minutes when the necessary special conditions prevailed in the hypothesized explosive origin of the whole universe? Or are they currently formed, and dispersed throughout interstellar space, by the *supernovae*—those stellar catastrophes that suddenly transform a reasonably calm sunlike body into terrific explosive radiation that equals for a brief time that of a thousand million ordinary stars?

D. *Time* and duration can be presented under the following titles:

1. The geological ages table—an alphabet for time
2. Clocks, planetary rotation, and molecules as timekeepers
3. Radioactive rocks and the age of the earth
4. Photosynthesis as an indicator of solar age
5. Fossils and the origin of the earth

We have long considered the rotation of the earth in the vacuum of surrounding space as our best timekeeper. The rotation is measured against the stars and is known with astounding accuracy. But the rotation of the earth is affected by a variable distribution of polar snow and ice, and there are internal adjustments still going on. Also the moon, through its production of the earth's largest tides, acts as a varying drag on the rotation. The earth's incompetence as a keeper of cosmic time has incited the development of ingenious clocks, the use of the vibrations of crystals, and more recently the timing of tremendously swift and accurate vibration of atoms in the molecules of ammonia and other substances.

The pulsing variable stars are also timekeepers, of lower accuracy, and so is the rotation of our Sun around the center of our galaxy. But the most impressive and cosmically useful calendar is that provided by the spontaneous and natural decay of uranium, thorium, and other radioactive elements that are embedded in the earth's crust. In these radioactive rocks, where the decaying atoms of uranium grow less while the end products, helium and lead, grow more, we find the fossils of ancient life. From their own standpoint the animals and plants of the past eras are very dead, but they are exceedingly alive in our reconstruction of the story of biological evolution. The distribution, nature, and age of these fossils are also of value in solving the puzzles of the origin and early days of our planet. The fossil-bearing rocks also testify to the long dependability of sunlight.

E. The discussion of *Space* as a fundamental entity was begun on a preceding page. Useful divisions of the arguments are:

1. Table of material organizations—an alphabet for the universe
2. Organizations of the microcosmos—atoms to colloids
3. Organizations of the macrocosmos—comets to galaxies
4. The space-time complex and the expanding universe
5. Theories of "once only" and "continuous" creation

Various hypotheses of the origin and early days of the universe are now recognized. The two outstanding theories are those associated with the speculations of Canon Lemaître who proposes a single-act creation, some billions of years ago, from an all-inclusive cosmic atom of which the origin is not specified; and the recent proposal by a group of English mathematical astronomers (Bondi, Gold, Hoyle), which holds that the creation out of nothing of matter in a simple form, for example cold hydrogen atoms, is going on at the present time at the proper rate to maintain in this expanding universe a fixed average density of matter. Both hypotheses have plenty of trouble ahead of them and a paucity of observations behind them. Their main value is the demonstration of the fertility of the human imagination and the bravery of the uninhibited scientist who insists on asking "How come?"

F. The four major tabulations that serve in the attempt at orientation in a partially understood universe can advantageously be supplemented by a few other summarizing aids. Some of these are embodied in the subdivisions of the major tables, for example, the types of galaxies. Others can be presented as minor alphabets. Six of them are the following:

1. The *planets of the solar system* (periods, distances, rotations, sizes—all of which are significant in cosmogony)
2. The *major phyla* of animals and plants—the descendants of sunshine and the primeval soup
3. The *fundamental particles,* including the evanescent mesons, positrons, and neutrinos
4. Classes of *mammalia*
5. Sequence of *stellar spectra*
6. Types of *animal societies*

G. Equipped with general information on the interrelated phases of the physical and biological universe, we can now give effective attention to a number of *evolutionary problems.* I have found the following the most basic and approachable from the cosmographic standpoint.

1. The flow of time and space
2. The origins of stars and galaxies
3. Evolution of the solar system
4. Origin of organisms
5. Climate and life
6. Origin of "societies" (star clusters, volvox, termites)

Several of these problems are as yet quite beyond our ability to handle definitively. But in the light of the many important scientific and philosophic contributions of recent years, all are subject to profitable exploration.

H. The survey of Cosmography can be concluded according to the following outline, which again is ambitious but not necessarily too pretentious:

Retrospect and Prospect

1. Reorientation, and a historical sketch of cosmologies.
2. Some unsolved problems: (*a*) of the microcosmos; (*b*) of the macrocosmos; (*c*) current cosmographic research.
3. On destinies: (*a*) of man and social organizations: (*b*) of sun and stars, energy and matter, space-time.
4. The religion of rationality . . .

LIST OF REFERENCE BOOKS

The following special treatises will be of value to the reading student, in supplement, of course, to the foundation college texts in the various sciences. If selectively read, these books will give a balanced view of the subject:

1. Bronowski, J. The Common Sense of Science. Harvard University Press. 1953.
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4. Raymond, Percy E. Prehistoric Life. Harvard University Press, 1939.
5. Simpson, G. G. The Meaning of Evolution. Yale University Press, 1949.
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7. Weeks, Mary E. Discovery of the Elements. Journal of Chemical Education, Easton, Pa., 1948.
8. Climatic Change, Evidence, Causes and Effects, edited by Harlow Shapley. Harvard University Press, 1953.
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——The foregoing is condensed, with permission, from an article entitled "Cosmography: An Approach to Orientation," from the July 1954 issue of the *American Scientist.*

SOURCE READINGS: INTEGRATIVE MATERIALS AND METHODS

The Foundation for Integrated Education is now reaching into educational sources outside the Uinted Sttaes for information o n current and research items. In this issue we are reviewing for the fist time some representative materials from Indian educational journals for the Source Reading section. This expansion is to continue to include materials from European countries and other parts of the world.

THE FUTURE OF EDUCATION IN INDIA

Zakir Husain

The future of Indian education is the future of the Indian people. For how can the Indian people hope to hammer into shape a pattern of just and honest and graceful living together, how can they aspire to establish a non-exploitative classless co-operative society free from want and fear without a much more extensive and a much more effective educational system than they have inherited? Indian education has a historic mission to perform in initiating and sustaining that Indian pattern of civilized social existence which we hope and trust will command the respect and admiration of all men of good will.

I just said we would require a much more extensive and a much more effective system of education than we have inherited. First, with regard to the extent: it is an extremely difficult situation we have before us. The inadequacy of educational facilities is alarming. With, perhaps, less than 40 out of a hundred children of the age-group 6-11, with less than ten per cent of the boys and girls between the age of 11 and 17 at school, and with less than one per cent of the age range 17-23 at the colleges and universities, with only about 17 per cent of the population literate, an enormous expansion of the provision of education is called for. The directive of the Constitution that free and compulsory education should be provided for all children up to the age of 14 within ten years of the commencement of the Constitution will, I am afraid, not be carried out.

It seems to me that it will be difficult to reach the educational targets of the Five-Year Plan. From what I have been able to gather about the progress of the educational scheme, my guess is that we are likely to be behind schedule. But I feel sure that the experience gained during the first Five-Year Plan will not be lost and the pace of educational development will be considerably accelerated in the succeeding plans. More liberal provision will probably be made for education, and it will be more fruitfully used. The setting up of the full machinery of national education should easily take another 25 years, given steady effort and a steady flow of resources over that period. When set up it will be a gigantic system of education. But size is not a moral quality; bigness is not always goodness, nor greatness. The more important thing is what we would do with that gigantic machine, what purposes it would serve.

This brings us to the more difficult guess as to the future development of the aims and objectives, content and methods of Indian education. What is the nature of the educational process? The process of mental culture or real education shows a striking resemblance to the process of growth and development of the human body. As the body grows and develops by means of suitable food, so does the mind. Food is supplied to the mind by the cultural goods of society: its sciences, its arts, its technique, its religion, its customs, its moral and legal codes, its social forms. These cultural goods are the only means of setting the educational process into motion.

But it is important to remember that every mind cannot make use of the same cultural goods. Every man has his own specific way of reacting to the world of men and things. The specific mental constitution of the educand determines his original indigenous circle of interests. These interests are directed towards objectifications of similar interests. I feel sure that the axiom of congruence between the individual mind and the mental structure of the cultural goods used for its cultivation will be the guiding principle of our future educational development. Gandhiji made this an integral part of our education by his insistence on handwork as the medium of instruction of boys and girls up to the age of 14, by making us see that the dominant psychical characteristic of this early age-period is practical activity. A fairly uniform type of school based on hand-work can serve the needs of the vast majority of children.

Then, during the period following basic education, when the differentiations of mental structure become noticeable, the axiom of congruence between the subjective and the objective mind will express itself in the form of a diversified system of Secondary Schools or Colleges adequate to the needs of development of the chief types of mental make-up: in theoretical schools of the literary type, theoretical schools of the mathematical scientific type, art schools, agricultural and commercial schools, and teachers' academies. This diversified system will keep constantly in view the fact that none of these schools can hope to be accurately adapted to the specific needs of all individual pupils. They will, therefore, see to it that the whole time of the pupil is not claimed by the prescribed work of the school and that opportunities and

facilities are provided for the pupils to apply themselves to aspects of culture not adequately represented in the required school program.

The apparent limitation which these Basic and Secondary Schools will appear to impose on the demand of what is termed "general culture" will be a distinct gain. "General culture" will not enjoy false prestige, and information will not be mistaken for education. The realization will become common that the school is a place of educating the mind and not of amassing ill-digested information. Even in the field of higher education it will be at points of what may be called "concentrated application" that the real opportunities of insight and cultural growth will be available for each individual.

Fruitfully engaged on a limited field, the mind begins to cast its net wider and draws nourishment from the adjoining cultural regions. The introduction to these fresh fields is best secured when the student's absorbing interest in his work brings him face to face with problems where knowledge of other fields is helpful. That is the way to general education, and not an indiscriminate agglomeration of cultural goods with equal emphasis on all. Our educational institutions of the future will create conditions that will make the mind grapple with cultural goods, assimilate them, reconstruct them, improve them, live the values inherent in them and create similar values. They will subscribe to the belief that in this way the mind is educated.

The idea of educationally productive work as the principal means of education will run through our future educational system. It can be manual work; it can be mental work. Educationally productive work is all activity which initiates new ideas and combination of ideas. It is purposeful activity and tends to lead on from purpose to purpose. These purposes make it necessary to acquire a good deal of traditional passive knowledge and a good deal of mechanical skill. These too, therefore, will have a place in education, to reinforce productive mental work.

This leads to the third important ingredient in Indian education of the future. The purpose of intellectual development and mental growth is essentially an egoistic one. It is work on and for oneself. That is its danger to education as a social force. Persons engaged in productive mental work can easily grow into partial, socially indifferent or useless men. Productive mental work should, therefore, be placed in the service of society. The service of others is essential for man's moral and social growth.

All our educational institutions will be communities of work. At these educational institutions, pupils will have facilities to experiment, to discover, to work, to live where work will fashion character and living will shape lives. They will grow into communities engaged in cooperative endeavor, with active members exercising initiative and accepting responsibility, through an inner urge for self-discipline, self-realization and mutual helpfulness. The true value of knowledge comes out only when it functions. Our educational institutions will all aspire to be temples of redeeming knowledge and communities of worthwhile living.

This may sound to some like a dream, to others like a much too ambitious program. I consider it to be the faithful delineation of our educational edifice of the not very distant future, for it implies the coming to fruition of ideas which are already at work and which are sure to result in transforming our educational system from a random growth to a consistent whole.

—Condensed from an article in *The Education Quarterly,* December 1953, published by the Ministry of Education, Government of India

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EDUCATION IN FREE INDIA

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. . . Man is a spiritual being even though he has an animal nature as well. The evolution of humanity is the gradual process of transforming man's animality and developing his spiritual nature. Religion is a powerful agency that helps to bring about the spiritual regeneration of man. It is true that in the history of the world certain dogmatic, institutional and sectarian religions have done more harm than good to the human race and often retarded its peaceful progress. But that is due not so much to the intrinsic nature of religion itself as to its prostitution for non-religious ends and purposes. Wherever religion has been made the instrument of tyranny and oppression, we may reasonably suspect the presence of mean motives of personal gain or national exploitation. Religion as a sincere and firm faith in the self of man within and God overhead is not only a rational belief but a saving grace for the life of man. It gives man a safe anchorage in the ocean of life and sustains him amidst the dangers and difficulties in the journey of life. Religion in this pure and universal form must be made a part of the training of young minds.

So far we have tried to explain the different parts and aspects of education in general. Now we proceed to indicate the special form and type of education that should be imparted to the Indian youth in free India. The educational system of a country must be suited to the genius of the race or the people who inhabit it. It should also respect the tradition and culture that exist in the country and constitute the common heritage of the race. During the British rule in India for about two centuries the system of education obtaining in this country hardly satisfied these conditions. It was adapted more to the administrative needs and purposes of the ruling class than to the building up of the Indian nation. Now that India has attained independence after many years of hard struggle and intense suffering, she should adapt her educational system to the national needs and ideals

and make it suited to the spirit of Indian culture, on the one hand, and the modern conditions of life, on the other. The eternal culture of India is spiritualistic in spirit and has its primary basis in the Vedas and the Upanishads, and is summed up later in the teachings of the Bhagavadgita. Hence in the system of education in Free India, provision should be made for the study and dissemination of Indian thought and culture, especially of Indian philosophy and religion. To achieve this end, Sanskrit language and literature, which are the repository of India's ancient culture, should be given an important place in the education of the Indian youth. But while India may be rightly proud of her spiritual heritage, she cannot afford to shut her eyes against the movement of things and events in the world outside. At the present age, the Western world has made immense progress in the study and development of the physical, mental, industrial, commercial and political sciences. The practical achievements of the Western countries in the field of science are as great as those of India in the life of the spirit. But the scientific culture of the West seems to be a stupendous body without a soul, and the spiritual culture of India a meagre soul without a vigorous body. To keep pace with the movement of the world and to infuse new life and vigor into their spiritual culture, Indians must study and acquire a mastery over the Western sciences. In a Free India, therefore, the system of education must effect a synthesis of all that is best in her spiritual culture and the scientific culture of the West. It is only in this way that Indians can become a vigorous and prosperous nation in the world, and India can occupy a place of honor in the comity of nations and contribute to the peace and prosperity of the world at large.

——From *The Modern Review,* March, 1952.

EDUCATION IN THE INDUS VALLEY

H. Heras, S.J.

Ancient times are generally associated with lack of education and obscurantism. Yet this notion is in many instances incorrect. Just the opposite is proved by the constitution of the four *asramas* in ancient India, when they placed the young *brahmacarin* under a strict discipline of training in order to acquire wisdom from the beginning of his life. How well educated were the people of the Indus Valley in more ancient times may be seen from a few references to what we know of their achievements through studying their archaeological remains and deciphering their inscriptions.

The numerous inscriptions engraved upon seals, amulets, utensils and potsherds are the first evidence of the literacy of those people. Not only did they know how to read and write, but we even may, perhaps, affirm that they invented that clever system of writing. Prof. Stephen Langdon, of Oxford, affirms that the first script of man was pictographic to a very great extent.[1] Now, in the Indus Valley script we have a very primitive pictographic script, since we possess a series of developed signs out of the primitive ones, which still exist in the script. We are, therefore, dealing with the earliest stages of the art of writing. Those people were the authors of that system of writing which afterwards developed in Sumer, Egypt, and the Mediterranean.

From the study of these inscriptions we now find that the principle of wisdom which identifies the latter with the Creator was clearly professed by the people of the Indus Valley. One of the names given to God in the inscriptions is *Vidukan*[2] which means "the one whose eyes are always opened"; the eyes being for us a source of knowledge, this expression is equivalent to saying, "one whose knowledge knows no limits." Equated with this name is another describing this *guna* of knowledge more vividly. God is also said to be *Min Kan,* "one who has fish eyes." For fishes, having no eye-lids, cannot shut their eyes.[3]

This wisdom of God was for the Indus Valley people the supreme standard of knowledge and perfection, for an inscription, on a man who had died and was wished eternal happiness in the other world, brings out the fact that this man had "fish eyes" as the reason why such happiness is expected. *"Van ter or min kan val,"* which means: "Let the one who has fish-eyes on reaching the sky (i.e. dying) be happy."[4] The possession of fish-eyes is therefore a mystical expression to standardize the knowledge of man. Man may finally acquire God's wisdom.

This is the proto-Indian foundation of all those Upanishadic statements concerning the excellence of knowledge, that it is better than sacrifices,[5] that it frees the soul from evil,[6] that it leads to immortality,[7] that it procures the fulfillment of all desires,[8] that it frees man from all fetters.[9] The Buddha often said the same in a negative way, viz., that all the miseries of man come from lack of knowledge.[10]

There were, therefore, in the cities of the Indus Valley people fully equipped with wisdom and knowledge. They were called *kalteri,* "sages," in the inscriptions and are said to have lived in caves. This is only natural. The acquisition of wisdom leads man to the solitude of the forest, to the recesses of caves, where one may freely indulge in meditation and contempla-

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[1] Langdon, Pictographic Inscriptions from Jemdet Nasr, p. iv.
[2] Heras, "The Religion of the Mohenjo-Daro People according to the Inscriptions," Journal of the University of Bombay, V, p. 6.
[3] Once Yudhistira while in the forest heard a voice asking him: "Who sleepeth with open eyes?" He at once replied, "A fish doth sleep with open eyes." Mahabharata, Aranyaka Parva, 17349, 17350.
[4] Heras, op. cit., p. 29.
[5] Brhadaranyaka Upanisad, III, 8, 9-12.
[6] Ibid, IV, 4, 22-23.
[7] Chandoya Upanisad, VIII, 6, 5-6.
[8] Taittiriya Upanisad, III, 9, 5.
[9] Naitri Upanisad, VI, 34.
[10] Digha Nikaya, II, Mahanidana, Suttanta, pp. 55, 58, Sanyutta Nikaya, II, 12, 10.

tion, the supreme function of man's soul for the acquisition of wisdom.

Besides ascetical knowledge which the possession of fish eyes clearly manifests, we have clear evidence of the development of two branches of human knowledge: astronomy and psychology.

Their knowledge of astronomy was rather advanced. They knew of the annual course of *El,* the Sun, through a band of constellations, the Zodiac, which they called *elvali,* "the path of the Sun." In this *elvali* they grouped the stars in such a way as to have eight constellations, which were styled after objects more or less figured in those groups: *Edu,* the Ram; *Yal,* the Harp; *Nand,* the Crab; *Tuk,* the Scale; *Ama,* the Mother; *Kany,* the Arrow; *Kudal,* the Water-Jar, and *Min,* the Fish.[11] These constellations, which were called "Houses of the Sun," corresponded to the eight months of the year; accordingly each month had about 45 days. The beginning of the year was in the beginning of *Edu,* the Ram. Consequently a new year was a new *Edu,* this word becoming synonymous for year. *Edu,* the Ram, was then in the winter solstice when the Sun went so fast through this house as to be said "to fly" over it, an expression which is not so strange in Indian scriptures, for the Sun is called a "bird" in the Rig-Veda. In winter, the time when the Sun is over the zenith is much shorter. On the other hand, when *El* entered the constellation of *Ama,* the Mother, the Sun was said to walk "like an ant," for it went very slowly through this house, as the sunny period of the day in the month of July, corresponding to this constellation, was much longer.

In order to observe all these movements of the Sun over the stars during the day, the Mohenjo-Darians had a kind of astronomical observatory, which they called *taltalil,* "a very bright house," for they could from within it see the brightness of the stars. In this house they had two long tubes passing through the wall, the room otherwise having no openings. It was the principle of the telescope, a principle which they had undoubtedly learned at the time of the construction of the many wells that are still in Mohenjo-Daro. From the bottom of the shafts of these wells they could observe the stars in the middle of the day. This principle of optics was cleverly applied by them to the observation of the stars.

One of the signs of the Indus Valley script, which has its equal among the Egyptian hierglyphs, has apparently a pictographic meaning which reveals their interest in psychology. The sign is as follows:

It means "to think" and reads *en,* in the proto-Dravidian language of those people. The sign seems to be a section of a vessel into which a rod is introduced. Such is a thought, as a matter of fact. Our intellect is like a vessel which has the mysterious capacity of eliciting ideas, but not without the cooperation of impressions from the outside world, through our bodily senses. Thus both our intellect, *manas,* and our body, *sarira,* concur in the production of a thought, but not in the same way: *manas* is the real cause of the thought; the sense impressions are only required to tickle *manas,* so to say, and to precipitate the production of the thought. This psychological genesis of a thought seems to have been graphically depicted in this sign, which has otherwise no connection at all with thinking. Naturally, the vessel is the important thing in the sign; without the vessel the contents held there could not be gathered together. The rod is only the instrument for stirring these contents, *buddhi.* It is thus that the thought is finally produced.

The manifestation of these two kinds of scientific study among the people of the Indus Valley, one of research into the inner self, the other of investigation of the movements of the celestial bodies and their application to everyday life for reckoning time, reveals a very high standard of education among the Mohenjo-Darians. Further research in this civilization may doubtless disclose new developments among them in the field of education, developments which have placed the Proto-Indian nation amongst the great cultural nations of the ancient world.[12]

[11] Cf. Heras, Studies in Proto-Indo-Mediterranean Culture, I, pp. 176-179.

CONCEPTS OF EAST AND WEST: EDUCATION AS MEANS OR END

According to Maulana Abul Kalam Azad, Indian Minister for Education, the West has looked upon education as a means while the East looked upon it as an end. Speaking in a symposium on the "Concept of Man and the Philosophy of Education in East and West" under the joint auspices of the Ministry of Education and the Indian National Commission for Unesco, he said, "If education is regarded as a means the question arises what is the end for which it is the means. The West has often regarded social welfare as the end, but social welfare is a concept which can be interpreted in different ways. In any case, the tendency to regard education as a means leads to some diminution in the value of education. I am inclined to think that the Eastern concept shows a truer understanding of its real nature. By regarding education as an end in itself, we recognize knowledge to be one of the ultimate values. I do not think that any Western philosopher would deny the importance of knowledge, but its value cannot be fully appreciated unless education is recognized as an end in itself. Further, such recognition would raise the status of man."

Maulana Azad emphasized that the Eastern and Western concepts of man were in some ways comple-

[12] Ibid, Vol. I.

mentary. "If the one has stressed the spiritual elements of his nature, the other has pointed out that spiritual excellence must also have the requisite physical basis. If in spite of differences in emphasis, the Western and Eastern concepts of man can be reconciled, there is no reason why the philosophy of education in these two regions should not also be fitted into a wider philosophy of education for the world."

The function of education in the modern world, he added, was to build up integrated individuals in an integrated society, and the concepts of both the East and the West must contribute to such a development.

——The foregoing extracts are from *The Education Quarterly,* December, 1953 and March, 1952 respectively, published by the Ministry of Education, Government of India.

THE INCREASING SEPARATION OF SCIENCE AND COMMON SENSE

The effects that the discoveries of relativity and quantum phenomena have had in revolutionizing our concepts of the world around us and our philosophical ideas regarding our relationship to the world are most dramatically described by Dr. P. W. Bridgman in "Science and Common Sense" (*The Scientific Monthly,* July, 1954, pp. 32-39).

"The new relativity phenomena were highly paradoxical and included such effects as meter sticks whose length changed when they were set in motion, clocks that ran slow when moving, and weights that became heavier when moving. In fact, these effects were so paradoxical and contrary to common sense that some physicists and most men in the street refused to accept them and even sought to throw them out of court by ridicule.

"The sort of phenomena with which quantum theory is concerned teach the same lesson as relativity theory, namely, that the world is not constructed according to the principles of common sense. The unfamiliar world of relativity theory was the world of high velocities; the new world of quantum theory is the world of the very small."

Dr. Bridgman explains that the conventional forms of thought are no longer applicable in the realms of high velocities and the very small. Whatever new way is devised to think about these new worlds, the meaning of the new concepts will have to be found back at the level of the large-scale events of daily life, because, as the author points out, this is the scale on which we live our lives, and it is we who are formulating the new concepts.

"The perceptions of time and space have been furnished to us by the machinery of our nervous systems. This machinery is a terribly complicated thing, which in spite of its complication does not give rise to perception until it has received a long course of preparation and education.

"It seems to be a general characteristic of our mental processes that we like to operate with static and complete things—we want our words to have fixed meanings and we analyze space into points and time into instants. But to sufficiently acute analysis, the fixed and static does not occur—it is something that we have constructed, and in so doing we have constructed away a whole world of mental phenomena."

We are coming to recognize, the author says, that the observer is part of what he observes and that the thinker is part of what he thinks. "We do not passively observe the universe from the outside . . . The common-sense way of handling our minds has, without doubt, been of decisive importance, and the discovery of the common-sense way of thinking was, doubtless, in the beginning a bit of an invention, perhaps the most important invention ever made. . . . Common sense evolved in the comparatively simple situations of the primitive experiences of the human race, and although it may have been an invention, we may be sure that it was an unconscious invention, adopted with no due consideration of its limitations or possible alternatives."

Now that the community has become the whole world, we are forced to revise the meanings that we attach to *truth* or *right* or *ought*. "At the very least, we shall have to evolve a new social philosophy and discover some method of getting rid of the provincialism that seems so right to common sense."

Dr. Bridgman concludes by saying, "we henceforth cannot regard a man as well educated who does not intuitively recognize that common sense is not to be taken for granted, or who does not handle his thinking as a tool in the awareness that every tool has limitations built into it. Such a man, looking to the past, can only be amazed that the human brain has, by cut-and-try methods, evolved procedures as effective as it has for dealing with the world around us; looking to the present, sees perhaps the most important reason for the present internal social difficulties of the human race in its uncritical use of traditional habits of thought; and looking to the future, can feel only optimism for the time when we shall have learned how to substitute consciously directed control of our thinking for the blind procedure of common sense."

—*Ruth Lofgren*

LIFE AS A MATERIAL EVENT IN THE ORDER OF NATURE

How living matter first arose on the earth is considered by George Wald in "The Origin of Life" published in the August, 1954 issue of the *Scientific American* (pp. 44-53).

Until about a century ago, there had been two answers to the question, "How did life begin?" One

was that life had been created supernaturally, the other that it arises continually from the nonliving. "The reasonable view was to believe in spontaneous generation; the only alternative, to believe in a single, primary act of supernatural creation. There is no third position. For this reason many scientists a century ago chose to regard the belief in spontaneous generation as a 'philosophical necessity.' It is a symptom of the philosophical poverty of our time that this necessity is no longer appreciated. Most modern biologists, having reviewed with satisfaction the downfall of the spontaneous generation hypothesis, yet unwilling to accept the alternative belief in special creation, are left with nothing."

The author thinks that the scientist has no choice but to approach the origin of life through a hypothesis of spontaneous generation. Pasteur and others merely showed that living organisms do not arise spontaneously under present conditions. "We have now to face a somewhat different problem: how organisms may have arisen spontaneously under different conditions in some former period, granted that they do so no longer."

Dr. Wald explains what would be required to make an organism: the right substances in the right proportions and in the right arrangement. The increasing complexities of the molecules of the fats, starches and glycogens, nucleic acids, and proteins that make up protoplasm are described and illustrated with chemical formulas. Then the author discusses the probability of getting such complex molecules together in suitable concentrations. He explains that given enough time, it could happen "at-least-once."

Laboratory experiments have demonstrated that amino acids can be prepared under conditions that may have existed in the early atmosphere of the earth. Also enzymes that play such a dominant role in the chemistry of life only modify the rate of reaction. Given enough time, the same result could occur spontaneously. Dr. Wald goes on to describe the forces of dissolution and integration that would be at work in such a system. In considering the formation of the first organisms, it is explained that "we now realize that it is not altogether necessary to *bring* order into this situation; a great deal of order is implicit in the molecules themselves."

"Oparin has made the ingenious suggestion that natural selection, which Darwin proposed to be the driving force of organic evolution, begins to operate at this level. He suggests that as the molecules come together to form colloidal aggregates, the latter begin to compete with one another for material. Some aggregates, by virtue of especially favorable composition or internal arrangement, acquire new molecules more rapidly than others. They eventually emerge as the dominant types. Oparin suggests further that considerations of optimal size enter at this level. A growing colloidal particle may reach a point at which it becomes unstable and breaks down into smaller particles, each of which grows and redivides. All these phenomena lie within the bounds of known processes in nonliving systems."

Dr. Wald explains the importance to the organisms of the development of cellular respiration which provided them with the "capital that they invested in the great enterprise of organic evolution."

"This is by far our most significant conclusion—that life, as an orderly natural event on such a planet as ours, was inevitable. The same can be said of the whole of organic evolution. All of it lies within the order of nature, and apart from details all of it was inevitable." ——*Ruth Lofgren*

NEWS AND NOTES

1954 SUMMER WORKSHOP AT WISCONSIN STATE COLLEGE

The eighth summer workshop of the Foundation for Integrated Education, co-sponsored by Wisconsin State College, was held in Milwaukee, July 19 to 23 and proved to be useful both to the fifty persons attending and to the future development of the work of the Foundation. The participants were housed and all the sessions were held in Kenwood Hall of the College, a handsome estate on the shore of Lake Michigan.

We are indebted to Dr. G. E. Watson, Wisconsin State Superintendent of Public Education, who came from Madison, to join with President J. Martin Klotsche of the College in welcoming the participants in the workshop.

The theme of the workshop was the implications of advances in knowledge in the last half-century for re-uniting the cultural heritage and the applications of this integration to American secondary and college education and to the world scene. The uniqueness of the human knowing process was also examined as an integrative factor.

Professor Henry Margenau analyzed the procedures essential to modern exact physical science in developing his topic, "A Basic Methodology for Integration." The discussion of this topic as fundamental to the main theme of the conference was most fruitful. Specific applications of integrative methods to the teaching of basic concepts in Physics and Chemistry were discussed by Prof. Vernon Bollman of Occidental College, California.

Prof. Ludwig von Bertalanffy, the distinguished biologist of the University of Ottawa, in his brilliant paper, "General System Theory: Its Role in Scientific and Educational Integration," brought forward the specific philosophically important features of the life process (such as their characteristic open systems, self-regulation, etc.). This gave opportunity for discussion of the significance of these aspects of nature, in contrast with specific closed systems commonly examined in physics. Dr. Ruth Lofgren, formerly Professor of Bacteriology of the University of Michigan and now with the Foundation for Integrated Education, led a discussion on the teaching of life sciences using integrative basic concepts.

The educational implications of the perceptual and cognitive processes of the human mind were discussed by Harvey W. Culp, of the Foundation, under the topic, "The Knowing Mind in the Orderly Universe." Curricular problems implicit in this and previously-discussed topics were considered by a panel comprised of the co-chairman of the workshop, Dean A. A. Suppan, Wisconsin State College; Mr. Thomas Schuller, headmaster of Scarborough School; Mr. Culp; and Dr. Morris I. Stein, of the University of Chicago. In this panel, Dr. Stein made a major contribution in respect to important psychological elements in the integration of the individual.

The final evening session was devoted to a discussion of "Applications to the World Scene" by Mr. F. L. Kunz, of the Foundation, in which the problems of cultural rapprochement were considered.

The participants generally were indebted to a group of teachers and administrators who devoted much scheduled and unscheduled time to discussing classroom actualities and needs. A panel, formed under the chairmanship of Dr. Peter Siegle, Director of the Center for the Study of Liberal Education for Adults, Chicago, with Dr. Lofgren as Secretary, brought to the closing session an informal summary of the assumptions and the interests of the group. This will form the basis for materials which will be worked upon and provided in due course by the Foundation.

The three major assumptions in this summary were: (1) Integration is desirable and (integrated) education should lead to the integration of the individual, (2) Insight into the process of cognition-perception will lead to integration of the individual, and (3) Our concepts must be selected on the basis of two criteria, (a) relevance to traditional educational compartments, (b) presumed advantage to educational strategy. In addition to an examination of these assumptions and the exploration of concepts, the summary expressed the interests of the group in taking a single concept, such as organism, order, etc., and developing it in its relations to many fields. They wish to explore also the operational problems of the integrated person in terms of classroom situations and how concepts may be integrated in the new frame of reference vertically (elementary school through college) and horizontally (interdepartmentally).

CONFERENCE ON RELIGION IN THE AGE OF SCIENCE

"Religion in the Age of Science" was the topic of a conference at Star Island, New Hampshire, July 31 to August 7th. A series of thoughtful addresses by Dr. Edwin P. Booth, Professor of Historical Theology, Boston University, served to review for the group specific features of Judaism, Buddhism, the Socratic impulse, and Christianity, and discussions conducted by other theologians and scientists explored various aspects of religion, especially its appearance as motives among some scientists.

The workings of science in several of its important branches were exemplified in addresses by men from departments of philosophy, physics, biology, and psychology at Brown, Harvard, Yale and elsewhere. Each day was concluded by a free discussion in which efforts were made to confront fundamental problems in an atmosphere of genuine inquiry.

The conference was refreshing and valuable. There should be—and doubtless there will be—much more of all this in more parts of the country. Members of the Unitarian community are particularly active in this matter.

It is possibly in order to suggest that such occasions as these could be made even more profitable if the leaders and the company could have attention invariably focussed—perhaps in part by advance preparation—upon certain previously known basic problems which impede the consensus that is sought, and the relevant facts indicated. One evening (for example) the discussion was actually concerned with consciousness and the cognitive problem. But since the pertinent state of the contemporary learned mind had apparently not been made clear, the discussion tended to get involved in many important, but yet only attendent, ethical and other considerations, leaving the basic questions unformulated: Is man a conscious, self-responsible entity? What is consciousness? Upon what can we agree when it is regarded in the light of evolution, of religious experience, of laboratory psychology and the like?

The company was not always confronted with an unmanageable complex. On some occasions the basic issue—whether it may be called psychological, religious, methodological, or by some other term does not matter—was actually formally made clear. Thus Professor Henry Margenau carefully identified reasons why certain scientific criteria can be said to reveal specific resources in human psychology which must be brought into play if science is to progress. He denominates these metaphysical requirements, because they are of an ideational character. His discussion of these matters with Professor Philip Frank (who appears to tend to assign the criteria to social forces) brought the issue into sharp focus, to general advantage.

The foregoing suggestion will not, we hope, be taken to be evidence of ingratitude for a happy and productive meeting, but rather of lively interest.

THIS I BELIEVE*

Julius Stulman

I believe that the greatest difficulty we have is our inability to evaluate properly ourselves and the things we deal with in our generation. It is because of this inability that we have compounded so many errors, built up a veritable mass-maze requiring specialists at all points to give us direction. We have become too fragmented in our thinking and diffuse in our direction and seem to be able to make corrections solely at crisis points—only to establish the basis for a new crisis.

Looking back into history even some 200 years, we can quickly recognize that what was considered mostly true then is considered largely false now. How really wise have we become in such a short time?

I believe all things are transitory and that most people are only able to judge the events and conditions in their lives and acknowledge the achievements of their time relative to their own understanding. I believe that values change with broader horizons through the application of more knowledge and understanding. It seems to me, therefore, that we can go forward more rapidly in solving our own, and mankind's problems, by grasping the fact that what is essential is to understand the methodology of pattern under which we operate, rather than be trapped in the content. It is the pattern itself that is of the essence and that establishes the content.

Recognizing this, I devised a method of establishing new patterns for myself and others. I take the "as if" position. That is, I try to solve my problems as if this were the year 2,000. I use my imagination, and speculate on future developments in the light of that distant time. Then I look back to the erroneous period of 1954 and try to re-establish value, purpose and direction in the light of this speculation, and uncover values where seemingly none exist. I try to avoid being bound by the acknowledged values established in this, our time.

To apply this approach, however, I must not only step out of my own period of time, I must also step outside of myself as a personality. I often ask myself: "What would you like to become, say in five or ten years from today? What, deep down, do you think you can accomplish?" Then, I think of myself in that already accomplished position, and act accordingly.

In the same way I believe that we can find the answers for many of civilization's problems. The wider the reference frame, the more integrated the understanding among men; the more common accepted values and interests become, the less friction we shall have. On the economic level, the wider the distribution, the greater the ability to create new values and new distribution systems, the more quickly will living standards throughout the world be raised. Indeed, it is possible for us to create an ever-expanding world economy.

In establishing the broadest possible reference frame, I believe we encourage interrelationships, not isolationships. We understand that all fixed positions are contrary to natural law and bear within themselves the seed of their own destruction. I refuse to take a fixed position in my thinking, whether I am concerned with economics, philosophy or sociology.

I believe that the individual can best benefit by his contributions to the whole. Recognizing that the whole is greater than the sum of its parts, I believe that an individual's contributions feed back to him the increased benefits that can only come from the greatest possible distribution of man's goods and a synthesis of man's best thinking to all mankind.

EAST-WEST PROGRESS

In cooperation with the Secretariat of Unesco, the International Council for Philosophy and Humanistic Studies (15 Avenue Kleber, Paris 16) has undertaken a study of the ways in which the meeting of Oriental and Western civilizations is being reflected, or can be reflected, in college curricula. The Committee of the Council is currently making preliminary inquiries among teachers as to a meeting to discuss this matter. Their letter, dated June 4, 1954, contains these sentences: "When the 'humanities' are stretched to cover all of humanity, the result produced [in a humanities course] will be anything but 'humanism.' A cultural chimera is apt to be the result." It speaks also of the additional load if enlargement is made, and goes on into details of such an added load.

Frustration is likely from the intended study if we cannot concede that there is such a thing as a common cultural potential constitution natural to all of mankind, warped though it doubtless is by the special forms of thought imposed upon the individual as he grows up. The aberrations from a norm are just as clear and as disastrous in the West as in the East, if not indeed more so. The firm anchorage of science (as a cultural experience) is the safe place to start.

It is more than high time that Indian scholars, in particular, come to the aid of teachers in the West, showing them that there is a short cut to the goal of understanding, namely, a thoroughly rational and firm fusion of the primary philosophy and metaphysics of India—by which one must mean the essential unity of thought in the *darsanas*, including the vedanta, as shown for example in Chatterji's *India's Outlook on Life* and in P. T. Srinivasa Iyengar's *Outlines of Indian Philosophy*—with the now-emerging metaphysics and cosmology of western science.

——*F. L. Kunz*

* Mr. Julius Stulman, New York industrialist, is a co-founder and a member of the Council, as well as a director, of the Foundation for Integrated Education. His address was broadcast over the program edited by Mr. Edward R. Murrow of C. B. S. on August 6, 1954.

REVIEWS

RESEARCH IN ALTRUISM:

P. A. Sorokin and Others

Since its inception in 1949, the Harvard Research Center in Creative Altruism has been supported by a grant of $20,000 annually by Mr. Eli Lilly and the Lilly Endowment, and directed with acumen and pioneering vigor by P. A. Sorokin.

To its five previous publications have now been added a new volume, *The Ways and Power of Love,* by Professor Sorokin himself, and another, *Forms and Techniques of Altruistic and Spiritual Growth,* assembled under his editorship. (Both published by Beacon Press, Boston, 1954, $6 each.) The earlier volumes were:

1. Pitirim A. Sorokin (editor), *Explorations in Altruistic Love and Behavior: A Symposium.* Beacon Press, Boston, 1950.
2. P. A. Sorokin, *Altruistic Love: A Study of Some 1,000 American Good Neighbors and Some 4,000 Christian Saints.* Beacon Press, Boston, 1950.
3. P. A. Sorokin, *Reconstruction of Humanity.* Beacon Press, Boston, 1948.
4. P. A. Sorokin, *Social Philosophies of an Age of Crisis:* Danilevsky, Spengler, Toynbee, Northrop, Kroeber, Schweitzer and others. Beacon Press, Boston, 1950.
5. P. A. Sorokin, *S.O.S. The Meaning of Our Crisis,* Beacon Press, 1951, Boston.

We take the opportunity offered by the present additions to review the whole enterprise, which was earlier described as follows:

"The main task of the Harvard Research Center in Creative Altruism is to study the chief properties and functions of creative, altruistic love and, especially, to investigate and invent efficient techniques for the creative altruization of persons and groups, or find efficient ways for the production, accumulation, and circulation of creative love in the human universe.

"Just as medical science assumes that life and health are preferable to death and sickness, so the Research Center presupposes that love and free cooperation are greater values than hateful strife and coercion. A preliminary exploration of the phenomena of altruistic love, carried on by the Center, has well confirmed the age-old belief in love's enormous creative and therapeutic potentialities. The existing body of evidence shows

a. that love is a life-giving force, necessary for physical, mental and moral health;
b. that altruistic persons live longer than egoistic persons;
c. that children deprived of love tend to become morally and socially defective;
d. that love is a powerful antidote against criminal, morbid and suicidal tendencies; against hate, fear and psychoneuroses;
e. that it is an indispensable condition for deep and lasting happiness;
f. that it is goodness and freedom at their loftiest—the very heart and soul of all moral and religious values;
g. that love has important cognitive and aesthetic functions;
h. that, together with truth and beauty, it is capable of controlling freely, without any coercion, the biological and acquired propensities of man, his mentality and conduct;
i. that in this sense love is the loftiest and most powerful educational force for the enlightenment and ennoblement of humanity;
j. that its minimum is absolutely necessary for the durable existence of any society, and especially for a harmonius social order and creative progress;
k. finally, that at the present catastrophic moment of human history an increased 'production, accumulation and circulation of love-energy,' or an increased altruization of persons and groups, institutions and culture, is possibly the only real remedy for the prevention of new world wars and for the alleviation of enormously increased inter-individual and inter-group conflicts.

"Meanwhile, our knowledge of creative love, and especially of efficient techniques for its production and accumulation, or for the successful altruization of individuals and groups, is exceedingly meager. It still remains at about the level at which the 'know-how' and the technique of the production of material necessities were among the preliterate hunters, fisherman and collectors of free gifts of nature. For this reason mankind now neither produces the minimum of love-energy necessary for its well-being, nor does it know how to use this loftiest power for the alleviation of humanity's evils and for building a noble, wise and happy human universe."

In conformity with this declaration, the Center's publications now constitute the solid beginnings of a remarkable documentation of the identical, or very like, practices and attitudes and criteria of historically known sages, mystics, and genuine religious reformers whose terms of reference are chiefly inner and only secondarily outer. In this field the volumes add up to an encyclopedia of active religio-psychological practices and results. The studies are not intended to provide the details of the literature, history, and organizations of religions. Such matters are herein quite incidental. For them Hastings' *Encyclopedia of Religion and Ethics* still stands unequaled. (The sociology volumes supply for that field basic orientation no less essential. Here, however, we concentrate on the psycho-spiritual aspects.)

The Center is thus performing a remarkably important function, displaying the sweep and mastery we have learned to expect from its Director. The indexes, for example, in *The Ways and Power of Love* supply about 900 names of all manner of persons—from Epictetus to Edison, and from Zoroaster to Zimmer—whose experiences of elevated states of consciousness, or reports upon others, are called upon. Although the scope is wide, the treatment is not encyclopedic, but organic, commencing with a study of love as a manifold and polydimensional power, developing its place in the structure of a creative personality, examining ways of altruistic growth, and teachings of altruistic transformation of persons and groups. It is thus a remarkable and valuable reference work, as well as a manual.

The reader is not to look in these volumes for more than occasional glimpses—not constituting even bare outlines—of that natural, but supra-physical, cosmogony in which man has been described by many of the very

same thinkers and strivers upon whom these volumes draw for their substance. It is reasonable to hope that the Center's program may presently include this aspect of its chosen subject. Without proper presentation of their constitutive frames of reference, the descriptions of the practices, and the psycho-spiritual gains of Hindus, Jains, Buddhists, Jews, Christians, Moslems and others remain largely collections of empirical data. To refer to the Hindu-Buddhist concepts of universal law (*karma*) and conduct appertaining to that law (*dharma*), for example, is essential to the story, and this reference the writers provide. But without proper treatment of the poly-dimensional scheme in which these laws are conceived to work, they remain infertile and are denied full scientific status. *Karma* is not merely a physical principle. It is psycho-spiritual as well.

We may hope that it is part of the purposes of the Center to document the cosmogony common to the practices and gains, to which Professor Sorokin and his colleagues so brilliantly give universality in the factual level. For in *Forms and Techniques of Altruistic and Spiritual Growth* some of the collaborators have supplied data which must eventually lead to such an achievement.

To exemplify this we take a chapter, by Thérèse Brosse, entitled "Contribution to the Experimental Study of Altruism: Instrumental Exploration of Yoga Techniques," pages 189 to 282.

Dr. Brosse, formerly head of the cardiological clinic of the Faculty of Medicine of Paris University, has made the first study of the psychosomatics of *yoga* (1933) and later for the Center (1952) did an extended analysis of the pneumo-arterial rhythms of the yogic states. The reader will find the graphs and data in the place cited, and will see that evidence is now in to show that consciousness and will are causally deeper processes than the system which Western medicine has held to be quite autonomic. She also provides necessary parts of the Indian theory of these phenomena.

Such a contribution is historic, since all previous studies in English, such as those of Rele and Behanan, fail to provide anything except slight, and mostly subjective, evidence; or else they have offered a vast structure without objective data. Valuable as is such traditional theory taken by itself alone, as we find in *The Serpent Power* by Arthur Avalon (Sir John Woodruffe), it may leave the reader without conviction.

Dr. Brosse's study provides the clinical data, the physical evidence, and it thus supplies the needed coercion of facts to force us to attend to the theory. Western psychologists who are at last re-discovering consciousness will find this item a revelation.

Our present concern with Dr. Brosse's study is its bearing upon the cosmogony. So long as *yoga* was held to be only a subjective practice and a belief, its Indian theory could be disregarded. It is now being objectively established. Only a conceit of immeasurable effrontery will admit the existence of these resources in man, and at the same time reject the explanations offered by the Hindu experimenters. Naturally we are entitled to remain the judges of the validity of the theory. What is inconceivable is that we should concede the facts, and at the same time insist upon maintaining an invincible ignorance about the only theory ever proposed for the data.

Judging from the resources of Professor Sorokin and his colleagues, we may reasonably expect that in due course, though not apparently now in process, the Center will produce some literature which treats evidentially the regions in which the phenomena of consciousness, of love, of conceptualizing, and of logico-meaningful causality, along with *karma,* actually operate, in contrast with studies restricted to the personal or social displays which are outward consequences. In the 19th century this was not possible, but in our times the physicists have traced causality (for example) back to changes of states or systems, and the systems in turn to the supra-physical fields and one or two kinds of space-time.

The practical similar task for biology, psychology, and sociology is obviously vastly more difficult. Perhaps it can only be done by simultaneous attacks in each of those three areas, since each has its own elements, variables, and parameters. Whether or not undertaken in our time or no, these lie before us. The Harvard Center is doing invaluable work even now. We hope we shall not be regarded as ungrateful if we insist that its present opulent work encourages us to expect some of the rest of the riches.

——F. L. Kunz

BOOKS TO RELATE STUDENTS TO WORLD CULTURAL HERITAGE

Very often in the pages of this journal we have discussed the importance of relating the student (especially the secondary school and college undergraduate student) to the cultural heritage of *the whole of the human race.* As an heir to that culture, he is entitled to it. As a transmitter of that culture, he must have it. As a voting citizen during the next generation, he will be forced to live more and more in a world where the human race as a whole lives and goes forward as a whole if it is to go forward at all. Quite rightfully, many teachers ask us for source materials in this important project. In addition to five such volumes reviewed in *Main Currents* last year,* we hare review briefly six volumes wihch have recently appeared.

Back of History, by William Howells (Doubleday & Co., Garden City, N. Y., 364 pp., index, $5.00) gives us a popular and yet very accurate account of evidences of man's early millenia on this planet. This is a valuable antidote for the popular misconception that "pre-historic" man had no "history." As the author points out, teachers and all of us would be on surer ground semantically if we substituted "pre-literate" for "pre-historic," since that which we call "history" comprises only that very recent segment of man's habitation of the earth which could be called the segment of literacy.

In terms of the value to be derived from the additional depth of perspective which this book can give it is a

* *Ideas and Men, The Story of Western Thought,* by Crane Brinton (Prentice-Hall, N. Y., 1951, 550 pp., bibliog., index, $6.00).
World in the Making, by James Avery Joyce (Henry Schuman, N. Y., 1953, 153 pp., $3.50).
Mathematics in Western Culture by Morris Kline (Oxford Univ. Press, N. Y., 1954, $7.50).
The Triumph of the Alphabet, A History of Writing by Alfred C. Moorhouse (Henry Schuman, N. Y., 1953, 215 pp., bibliog., $3.50).
The Miracle of Language by Charlton Laird (World Publishing Co., Cleveland and N. Y., 1953, 291 pp., bibliog., index, $4.00).

tool of integration which every student and teacher of history or the social studies should have. Here, too, are to be found sensitive and well-written accounts of the origins of human societies, of man's arts and artifacts, and of early man's interactions with his physical and social environments.

Since nearly all "historic" processes had their origins "back of history," it would seem to this reviewer that, without some perspective into these origins, the student of "history" is as handicapped in his understanding of the drama there presented as if he had dropped in on the third act of a play.

One might say that, where the previous volume leaves off, *The Story of Our Civilization* takes up the thread. This book, by Phillip Lee Ralph (E. P. Dutton & Co., Inc., New York, 1954, 306 pp., index, $3.75) is not a chronological history in the usual sense. Nor is it concerned specifically with the usual "events" of history books. The author seeks to analyze the strengths and weaknesses of previous Western civilizations and to look for the causes of their declines into oblivion. In this way he seeks finally to diagnose and prescribe for the crisis of present civilization.

It is to be hoped that there are very few teachers of history left who still believe that the facts and "events" of history are the important matters in their field. Those teachers who realize the importance of concepts will appreciate such gems as these in this book: "Civilization appears as an unforeseen and arbitrary invention on man's part, changing the rules of the game in his favor, a daring attempt to dispense with nature as final arbiter. It is artificial, contrived, and therefore extremely fragile . . . Not only is it created laboriously but each successive generation must be taught to accept it and to utilize it . . . When civilizations fail, it is always man who has failed — not in his body, not in his fundamental equipment and capacities, but in his will, spirit, and mental habits . . . They [the Greeks] accomplished much because they believed in themselves. Men — and civilizations — live by their beliefs and die when their beliefs pass over into doubt . . . The real task ahead is not to create an industrial civilization but to create an ethical one. The ultimate rationale of civilization is the promotion of fuller, richer, more abundant life. If, instead of being devoted to this end, its resources are subverted to the gratification of the meaner impulses or to the constriction of life, then civilization becomes a predatory organism, a monstrous usurpation on man's part."

Interrelations of Cultures, a symposium on their contribution to international understanding (Unesco, 1953, 382 pp., bio-bibliographical notes, $2.00) has just been released in this country (Columbia University Press, distributors). This book should be a gold mine of source materials and perspectives in the various cultures which are parties to the present world scene.

Each chapter is written by a native authority of eminence. Here in brief span can be found essays on Chinese, Indian, Japanese, Spanish, Mexican, African, Negro and U.S.A. cultures as well as several on the unity and diversity of cultures.

Certainly, any teacher from kindergarten to graduate school should have sufficient background in these cultures to bring to her students at least some awareness of the beautiful essence of Chinese literature as it spans 3000 continuous years and as it exerts powerful influences upon the thinking of this dynamic forty percent of the human race. This is but one example. Every chapter in the book provides others.

Mention should here be made in this connection of *Science and Civilization in China,* Volume I, by Joseph Needham (Cambridge University Press, New York, 1954, 248 pp., bibliographies, index, illus., maps, $10.00). This monumental work is the first of a series of seven volumes which will cover the whole range of Chinese science, medicine, technology, etc. This volume of *Introductory Orientations* ranges from prehistoric times to the 17th century and gives insight into previously unrealized aspects of Chinese science and its contributions. Dr. Needham, whose contributions in his special field of biology are well-known, has done the world great service by providing this great, authoritative, and detailed work.

As a magnificent example of the integrative action of concepts—working themselves into philosophy, religion, folklore, customs, morals, and language to such an extent that they become "common sense," few books could be better than *The Origins of European Thought about the Body, the Mind, the Soul, the World, Time, and Fate* by R. B. Onians (Cambridge University Press, N. Y., 1954, 550 pp., indexes, $9.50). The author, who is Hildred Calile Professor of Latin in the University of London, has done an extremely scholarly job in giving us these "new interpretatons of Greek, Roman, and kindred evidence, also of some basic Jewish and Christian beliefs." This reviewer found it practically impossible to dip into the volume at any place without coming upon exciting and stimulating ideas. Not only will anyone interested in history, literature, etc., find a wealth of source material here, but even physical education instructors can make use of a great deal of this data!

The volume is replete with footnotes, many of which are as interesting as the main text. There is a great deal of Greek as well as Latin in the text but this is no handicap, especially since the author provides an adequate index of words in these and several other languages.

These volumes, together with the classic *Gods, Graves, and Scholars* by C. W. Ceram (Alfred A. Knopf, N. Y., 1951, 415 pp., bibliog., index., $5.75), *Animals, Men, and Myths* by Richard Lewinsohn (Harper and Brothers, N. Y., 1954, 394 pp., bibliog., index, $5.00), and André Malraux's indispensable *The Voices of Silence* (Doubleday & Co., Garden City, N. Y., 642 pp., index, $25.00) should prove of inestimable value in affording integrative enrichment for the entire humanities curriculum. True, they may come to a burdensome total sum in a school library budget but, in this reviewer's opinion, they are worth five times their cost in comparison with an equal investment in the usual source materials in such places.

——*Harvey W. Culp*

Dynamics of Growth Process is the collection of papers in book form of the Eleventh Growth Symposium held in June 1952 by the Society for the Study of Development and Growth. It is published by Princeton University Press (1954, index, pp. 304, $7.50). The book contains thirteen outstanding papers by leading authorities in each of the fields. It is fairly technical, but anyone who has had some biology and biochemistry will be able to follow the presentations.

The topics covered are: Virus reproduction and the replication of protoplasmic units, Experiments with the chemostat on the rates of amino acid synthesis in bacteria, Cytochemical aspects of protein synthesis, Inter-

action of nucleus and cytoplasm in cell growth, Cell and tissue differentiation in relation to growth (animal and plant), Physical factors affecting growth in plants, Chemical regulation of growth in plants, Chemical control of growth in animals, The relationship of skeletal status to the physical growth and development of children, Regularities in growth curves, including rhythms and allometry, Hereditary mechanisms in animal growth, and Quantitative aspects of population growth.

Anyone interested in the current research on the growth process will find this book a valuable addition to his library. The scope and authoritativeness of the subject matter and the clarity of presentation are all that could be expected from such a symposium.

—Ruth Lofgren

In *The Measure of Man,* by Joseph Wood Krutch (The Bobbs-Merrill Co., Inc., Indianapolis and New York, 1954, 261 pp., $3.50) we have a timely book whose sub-title is "On Freedom, Human Values, Survival and the Modern Temper." This book, which discusses the problems of our age from the point of view of the philosophical concepts in which they had their origins, should start the reader's thought out of the squirrel-cage rationalizations to which so many of us seem confined.

Defining our times as the age of loss of confidence, the author traces the history of western thought in search of causes for this condition. "Man has never seen very far ahead and perhaps never will," says Mr. Krutch, adding that, "He did not anticipate the real consequences of mechanical invention and he foresaw even less to what his intellectual processes would lead him." It almost seems, he believes, as if " . . .the Grand Strategy of 19th-century thought had as its aim the destruction of man's former belief in his own autonomy." Tracing this back to Hobbes' proposal that man is an animal and to Descartes' description of the animal as a machine, we come up with a concept which has had disastrous effect upon us: "Man is a machine." To these must be added Evolution, Marxism, and the Freudian psychology: "three inclusive new hypotheses, each in its own way as revolutionary as Copernicanism . . . Each emphasized the extent to which the human being is the product of forces outside his control." These concepts not only deprived man of any credit for his gains but also "relieved him of all blame for his sins and his crimes as well as for his follies." For such absolution, we have surrendered importance and dignity. Is it any wonder that the times are awry and that this is the age of loss of confidence?

The author is at pains to point out that once this situation prevailed it was but a question of a short time until educators, sociologists, and politicians became interested in the question of "what may be *done to him,*" since man is incapable of doing anything for himself. Here follows an incisive appraisal of behaviorism and other forms of rat psychology, of the "ignoble utopias" of *Walden II, Brave New World,* and other such. His remarks upon the "objectivity" of science, particularly as applied to the sciences of man and his society, are especially pungent and apt. More than merely the professionals should take them to heart as "even the general public which could not state its convictions so rigorously [as the positivists do] is at least committed to the belief that metaphysics is moonshine and that only 'practical' matters are worth discussing." It is high time for us to consider the ends for which the means of our power are applied and the logical argument of "survival of the fittest" needs certainly to be reviewed in some such terms as Mr. Krutch suggests: "Are we forced to the conclusion that the cockroach's success is the only sort which can have any meaning? Are there no reasons why it is 'better' to be a man than an insect? If there are, then some criterion other than the promise of continued survival must be applicable. For insects, for individuals, and for societies alike, there are ignoble as well as noble ways of surviving. Unless one survives *for* something, neither survival nor health has any value in itself."

With excellent writing the author reveals considerable knowledge of modern physical science and its philosophical implications. These he brings to bear with telling effect upon the basic problems set forth in the sub-title of the book. His discussions of human freedom, "The Minimal Man," "The Stubborn Fact of Consciousness" (which cannot be dismissed as a mere epiphenomenon), and electronic "brains" are provocative reading.

Pointing out that "many physicists have given 'free will' back to the atoms, but many sociologists still seem to deny it to the human being," Mr. Krutch discusses the "Old Fashioned Science of Man," which, by its mechanism, materialism, and determinism, has not achieved as great success as its champions would lead one to expect. His appraisal of the social sciences is summed up in this phrase: "They will never help us solve our problems as long as they continue to go on the assumption that whatever is true of a rat is true of a man. Indeed they will not be able to solve them so long as they assume that even a rat is adequately accounted for on the basis of mechanistic premises.

"The grand paradox of our society is this: we magnify man's rights but we minimize his capacities. And it is only in some totalitarian theory that this paradox can be resolved. Sub-men cannot rule themselves . . . More and more clearly it becomes apparent how absurd it is to talk about a 'free society' if that society is to be composed of individuals who cannot possibly be other than what circumstances make them." What more succinct and accurate appraisal of the roots of current malaise could one want? May it not be that the present author is telling us that we "have gained the whole world but lost our own souls"? Certainly it would seem so although the author is by no means a Cassandra for he perceives that "It May Not Be Too Late" in his final chapter. But it *will* be too late when we shall have passed that point where we have been conditioned to believe that metaphysics, arts, and the continuing "discourse" on value judgments which comprises the humanities are of no worth to man.

The Measure of Man is patently a call for new concepts as to the nature of man. And no scientist could possibly have staked out the area for research any better than Krutch: "Body and mind are connected in some manner for which simple rationality has no name and which is difficult for it to conceive . . . Perhaps man is a microcosm in some sense more significant than that implied in medieval philosophy. Perhaps the whole human world of consciousness and value is related to the whole world of physical fact in some fashion analogous to that of the relationship between the soma and the psyche in the individual man."

—Harvey W. Culp